

Independent contractor accident trends in the coal mining industry

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Recent employment figures (taken from the Mine Safety and Health Administration's database) indicate that the number of independent contractor¹ employees working in the coal mining industry has doubled over the past ten years. As their numbers increase, they become a more visible segment of the industry.

1); 13% were electrical accidents; and 9% were machinery accidents. Combined, these three accident classifications accounted for 69% of all coal mine independent contractor fatalities.

Information taken from fatality data is an important piece of the safety puzzle; however, other variables

need to be examined in order to better define contributing factors associated with accidents. More specifically, information on trends in fatal and nonfatal accident and

and injury information.

The following coal industry data sites specific and present trends of independent contractor employees working in underground locations at coal mines, surface areas of underground coal mines, surface coal mines, and preparation plants. The data compares employment and accidents for time periods at the beginning and the end of a ten-year span from 1985 to 1994. Because the number of incidents involving independent contractors in certain accident categories during any one year may be small, three-year totals are used; the first three years (1985-87) of the ten-year period are compared with the last three years (1992-94).

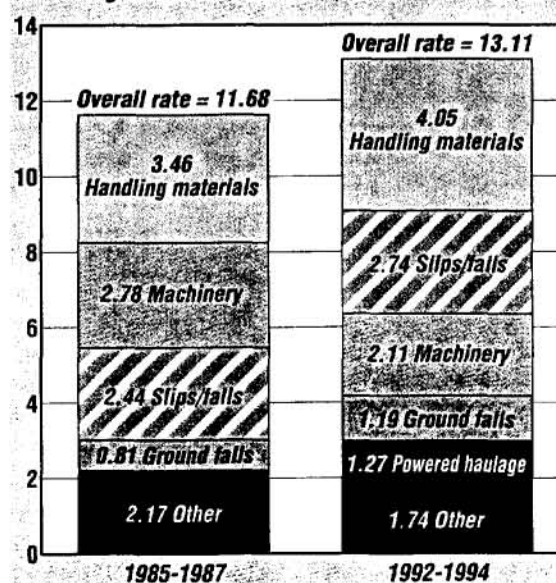
Table 1.—Independent contractor coal fatalities, 1990-1994

Accident type	Number	Percent	Cumulative percent
Powered haulage	21	47	47
Electrical	6	13	60
Machinery	4	9	69
Falling material	3	7	76
Ignition/explosion	3	7	83
Slips/falls	2	4	87
Explosives	2	4	91
Other	4	9	100
TOTAL	45	100	100

Increased exposure to mining hazards has also brought an increase in the number of fatalities involving independent contractor workers. One gauge that is traditionally used to evaluate the overall safety of an entity is the "number of fatalities." Over the five-year period from 1985-89, 27 independent contractor employees were fatally injured while working on coal mine property. This number increased to 45 fatalities during the subsequent five-year period from 1990-94. Nearly half of these fatalities (47%) were due to accidents involving powered haulage (See Table

injury data is necessary before deciding what approach should be used to improve safety. In order to implement appropriate safety strategies, it is important for safety practitioners to examine all available lost time accident

Figure 1.—Independent contractor lost-day accident rates* at underground locations of underground coal mines



* Accidents per 200,000 employee-hours exposure

Underground locations at coal mines

In underground coal mining, independent contractor employee hours increased by 176% (from 2.9 to eight million hours) from 1985-87 to 1992-94 (See Table 2). These hours represented 0.7% of all underground coal mining employee hours in 1985-87 and 2.5% of all underground employee hours in 1992-94. Although no fatalities occurred in either time period, lost

accidents which occurred during the two time periods are displayed in Figure 1. Contributing to the increase in the overall rate is a substantial rise in the rate of occurrence for powered haulage accidents which increased from 0.34 (included in 'Other') during 1992-94 to 1.27 during 1992-94. Rates for the accident classifications of handling materials, slips and falls, and ground falls have also increased, while the rate of machinery accidents has

classified under about 20 different underground job titles. From 1992-94, they were classified under about 40 different job titles. For example, during 1985-87, there were no injured independent contractor workers classified as section foremen or belt men. Roof bolters and utility men accounted for less than 3% of the injured workers. However, during 1992-94 section foremen, utility men, belt men, and roof bolters accounted for about 12% of the injured workers.

Table 2.—Number and proportion of employee-hours, accidents, and fatalities accounted for by independent contractors working in coal mining

Mining location	Years	Employee-hours		Accidents ¹		Fatalities	
		Number ²	Percent of all hours	Number & rate ³	Percent of all accidents	Number & rate ³	Percent of all fatalities
Underground mines	1985-87	2.9	0.7	172 11.68	0.8	0 0	0
	1992-94	8.0	2.5	527 13.11	2.9	0 0	0
Surface area of underground mines	1985-87	7.3	13.3	78 2.13	5.1	4 0.11	18.2
	1992-94	16.1	34.4	161 2.00	12.3	5 0.06	55.6
Surface mines	1985-87	23.7	6.9	303 2.56	6.1	7 0.06	14.6
	1992-94	42.6	15.4	476 2.23	11.5	19 0.09	45.2
Preparation plants	1985-87	9.3	8.7	260 5.60	11.2	1 0.02	6.3
	1992-94	17.9	19.1	270 3.02	12.6	7 0.08	53.8

¹ Accidents include injuries resulting in either permanent disabilities or lost workdays or both, but excludes injuries resulting only in days of restricted work activity.

² Employee-hours are reported in millions of hours.

³ Rates (in bold-italics) are computed as the number of accidents or fatalities per 200,000 employee-hours

day accidents for independent contractor workers increased from 172 to 527 which corresponds to an increase in the overall lost day accident rate (number of accidents per 200,000 employee hours) from 11.68 to 13.11.

Individual accident rates for the most frequently occurring types of

declined.

The scope of the work being performed underground by independent contractor workers appears to have expanded judging by the increase in the number of job classifications reported for injured workers. From 1985-87, injured independent contractor workers were

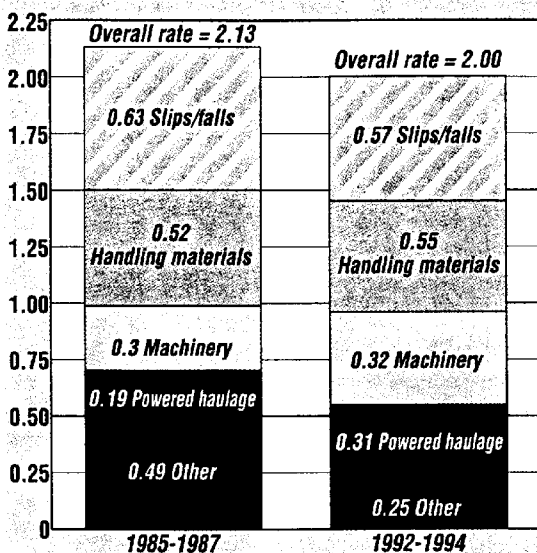
56%) were independent contractor employees. Although the number of lost day accidents increased from 78 to 161, the overall accident rate decreased slightly from 2.13 to 2.00 accidents per 200,000 employee hours.

A breakdown by type of accident (See Figure 2) indicates that

Surface locations of underground coal mines

At surface locations of underground coal mines, employee hours of independent contractor workers increased by 120% from 1985-87 to 1992-94. These hours accounted for 34.4% of the total hours reported for this mining location during 1992-94 (See Table 2). Of the nine fatalities that occurred at the surface locations of underground mines from 1992-94, five (or

Figure 2.—Independent contractor lost-day accident rates* at surface locations of underground coal mines



* Accidents per 200,000 employee-hours exposure

accidents due to slips and falls, handling materials, and machinery have occurred at about the same rate during both time periods. However, the rate of occurrence of powered haulage accidents has increased by more than 50% from 0.19 (1985-87) to 0.31 (1992-94). Additionally, while truck drivers accounted for 9% (seven out of 78) of the independent contractors injured from 1985-87, they accounted for 22% (35 out of 161) of the injured workers during 1992-94.

Surface coal mines

At surface coal mines, employee hours of independent contractor workers increased by 80% over the past 10 years. The 42.6 million employees' hours reported during 1992-94 accounted for 15.4% of all employee hours at surface mines (See Table 2). And while independent contractor employees comprised only 11.5% of the accidents which occurred at surface mines during 1992-94, they accounted for 45% of the fatalities (19 out of 39).

The overall lost day accident rate for independent contractors working at surface mines decreased slightly

(included in 'Other' from 1985-87) to .33 during 1992-94. This increase is reflected in the number of truck drivers being injured which increased from 26 (9% of the accidents) during 1985-87 to 88 (18% of the accidents) during 1992-94. On the other hand, welders, who accounted for 23% (70 out of 303) of the injured independent contractor workers in 1985-87, now account for only 12% (59 out of 476) of injured workers.

Preparation plants

At coal preparation plants, employee hours of independent contractor workers increased by 93% from 1985-87 to 1992-94. With 17.9 million employee hours reported during 1992-94, independent contractors accounted for about 19% of preparation plant employee hours (See Table 2). They also incurred more than half of the fatalities (seven out of 13) at preparation plants during this period. Despite a substantial increase in the fatality rate from .02 to .08, the overall accident rate for independent contractor workers at preparation plants

from 2.56 to 2.23. A breakdown by accident type (See Figure 3) shows substantial declines in the rates of handling materials and machinery accidents. However, the rates of accidents due to slips and falls, and powered haulage increased. In the case of the latter, the rate for powered haulage accidents more than doubled from .15

decreased substantially, from 5.60 during 1985-87 to 3.02 during 1992-94.

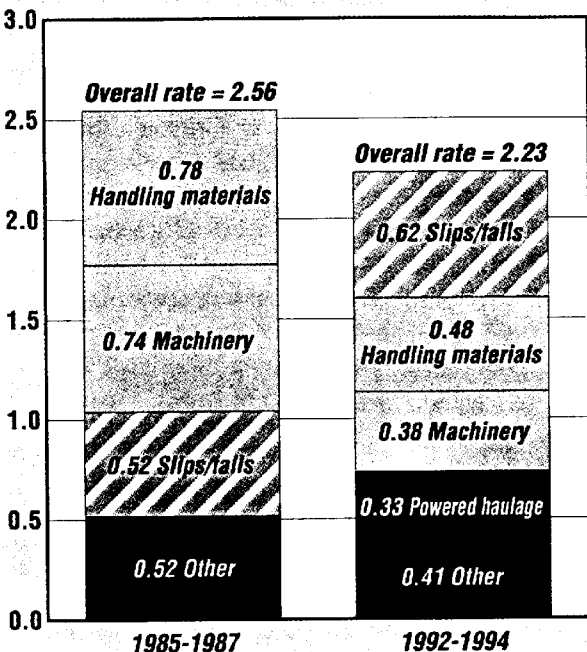
This decrease reflects large declines in the rates of accidents due to handling materials, slips and falls, and machinery (See Figure 4). Powered haulage accident rates have remained relatively unchanged. However, independent contractor employees classified as truck drivers, again, accounted for a greater proportion of the injured workers, increasing from 8% (20 out of 260) during 1985-87 to 19% (50 out of 270) during 1992-94.

Discussion

Over the past 10 years (1985-1994), U.S. coal production increased by 20% from 835 million tons to more than one billion tons. This growth included a 22% increase in surface production and a 15% increase in underground production. During the same interval, the number of both surface and underground mines decreased by about one-third. Similarly, the number of operator employee hours declined by about 39% at underground mines and about 33% at surface mines. However, the number of hours reported by independent contractor employees continues to increase throughout the coal mining industry. As their hours increase, independent contractor employees account for a greater proportion of both fatal and nonfatal accidents.

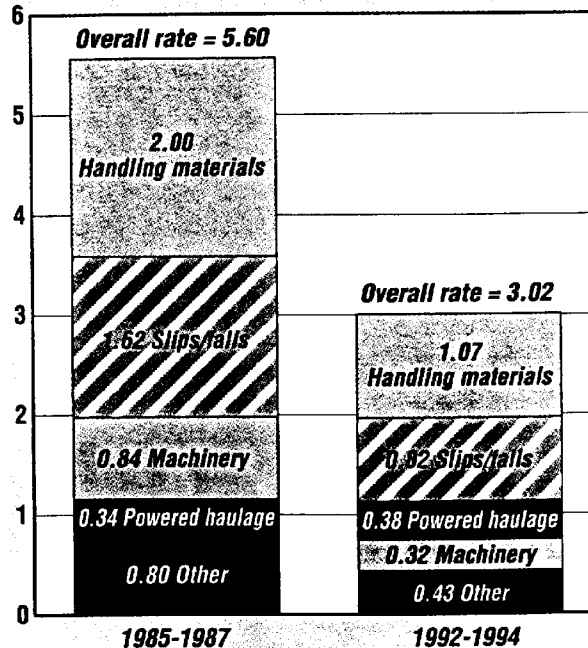
Powered haulage accidents are the leading cause of fatal injuries to independent contractor employees working in the coal industry. From 1990-1994, these accidents accounted for almost half of all independent contractor fatalities. Additionally, over the past ten years, increases in the rates of nonfatal powered haulage accidents were also observed for independent contractor employees working at both underground and surface mines. These increases are also reflected in the number and

Figure 3.—Independent contractor lost-day accident rates* at surface coal mines



* Accidents per 200,000 employee-hours exposure

Figure 4.—Independent contractor lost-day accident rates* at preparation plants



* Accidents per 200,000 employee-hours exposure

proportion of injured contractor workers in the job classification of truck drivers which more than doubled. Given these trends, safety interventions might be more effective if they include strategies that focus on the accident classification of powered haulage and the job classification of truck drivers.

Specific accident and injury data provides safety practitioners with information that can be used to develop effective safety intervention strategies. Trends identified in the preliminary analysis provide informa-

tion for developing a more focused approach. This preliminary analysis is only the first step in improving safety. Further research should be conducted to analyze independent contractor hazard exposure, level of training, and perception of risk as it relates to the performance of their jobs. Safety interventions, based on a clearer profile of independent contractors, should improve safety within this segment of the mining industry.

¹ Title 30 CFR, part 45, section 2c defines an independent contractor as: "any

person, partnership, corporation,...that contracts to perform services or construction at a mine." Mine operators employ independent contractors for a variety of production and support services. A sample of occupations include truck drivers, security guards, supervisors, technicians, equipment operators, mechanics, drillers and blasters, and construction workers. Although independent contractors are required to report annual hours worked on mine property to the Mine Health and Safety Administration (MSHA), they are not required to obtain an MSHA identification number. Consequently, the possibility exists that the number of independent contractor employee hours and accidents, while working on mine property, may be under reported.